REMARKS

Prior to this Amendment, claims 1-24 are pending in the Application. In the pending action, the Office objected to the drawings as failing to comply with 37 C.F.R. 1.84(p)(5) because Fig. 4 does not include the following reference character(s) mentioned in the description: TR1 and TR2. In response, Applicant amended Fig. 4 to include the character(s).

The Office objected to claims 1 and 12 as containing informalities. In response, Applicant corrected the informalities.

The Office rejected claims 1, 2, and 13-24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,936,607 (Allio); and rejected claims 3-12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,936,607 in view of U.S. Patent No. 6,184,969 (Fergason). Applicant points out to the Office that the issue date of U.S. Patent No. 5,936,607 was August 10, 1999. Applicant filed the pending Application under 35 U.S.C. § 371, claiming the benefit of International Application No. PCT/FR99/01927. The International Application has an international filing date of August 4, 1999 and a priority date of August 13, 1998. Therefore, it was improper for the Office to cite U.S. Patent No. 5,936,607 against the Application under 35 U.S.C. § 102(b). Accordingly, Applicant requests the Office to withdraw the existing rejections.

Applicant does acknowledge that U.S. Patent No. 5,936,607 corresponds to International Publication No. 94/26072, which is identified in the Information Disclosure Statement submitted herewith. In the interest of expediting the Application, Applicant will address the rejection as if International Publication No. 94/26072 was cited against the claims. However, Applicant will refer to U.S. Patent No. 5,936,607 when commenting on International Publication No. 94/26072 since the publication is in French.

In this Amendment, Applicant is amending claims 1, 12, and 18; and adding claim 25. Applicant requests reexamination in view of the amendments and remarks contained herein.

Amended claim 1 is repeated below for the Examiner's reference.

> 1. A method of autostereoscopically displaying an N-viewpoint image on a screen having display pixels disposed in rows and columns, each display pixel presenting $p > 1$ color points, corresponding to first, second, ..., and p^{th} color components, in which method the pixels of an autostereoscopic image to be displayed are displayed by distributing in space the p color points of each pixel amongst the color points of corresponding color components in p different display pixels, wherein, starting from a "high definition" autostereoscopic image presenting at least as many pixels each having p color points as the N viewpoint image presents color points, said autostereoscopic image to be displayed is generated in which each pixel is comprised of p color points of the corresponding color component of p different pixels in the high definition autostereoscopic image.

Claim 18 is repeated below for the Examiner's reference.

> 18. (Original) An N viewpoint autostereoscopic image presenting pixels disposed in rows and columns, each pixel being constituted by p color points of a different color component, wherein each of the p color points of each pixel is constituted by a color point of a corresponding color component offset in space in the same manner for each of the p different pixels of a group of p pixels of a viewpoint of a high definition autostereoscopic image presenting at least as many pixels having p color points as the N viewpoint autostereoscopic image presents color points.

The idea of the present invention is to compensate, at least partly, the loss of definition that results from the fact that the display pixels of the screen are shared between N viewpoints. The idea is to start from a high definition auto stereoscopic image that has at least p times more pixels than the screen, and for the display, take only one color point out of the p color points of the pixels of the high definition auto stereoscopic image (see page 9, line 31 to page 11, line 2 of the Application).

As explained in the Application page 2, lines 28 – 33,

> The distribution between p [color points of each pixel] of the image to be displayed is implemented on the basis of p different pixels of the high definition autostereoscopic image, whereas in the above-mentioned prior art [WO 94/26072; EP 791 847] this distribution was performed on the basis of the p color points coming from the same image point or pixel. (Emphasis added).

And page 3, lines 5 – 15,

> Given that the p color components of each pixel carry information are coming from p points that are distributed in space, the resulting image presents a resolution that is p times better in terms of brightness, whereas color definition has the same resolution as before. The spectator nevertheless perceives an image which subjectively presents definition that is improved by p times because of the improved perception of outlines, whereas the lower definition of the color ("smearing" color effect) is not perceived in stereoscopic vision.

And a more complete explanation as to how the improvement in resolution is perceived with stereoscopic viewing is given at page 3, lines 16 - 34 of the Application.

For International Publication No. WO 94/26072 (U.S. Patent No. 5,936,607), which Applicant is also the inventor of, the p color points of each pixel of the autostereoscopic image are used, in contrast with the present invention where only one color point of each pixel of the high definition autostereoscopic image is used. This high definition autostereoscopic image is defined as having at least as many pixels (*each having p color points*) as the N viewpoint image presents color points. Or in other words, the high definition autostereoscopic image has at least p more pixels as the N viewpoint image, which allows to take only one color point of each pixel of the high definition auto stereoscopic image so that the screen, although it has p less pixels than the high definition auto stereoscopic image, nevertheless displays an image that is perceived stereoscopically with a definition that is substantially the same as the definition of the high definition auto stereoscopic image, which represents a major improvement.

.....Referring to the pending Office Action, the Office considers that in U.S. Patent No. 5,936,907, the auto stereoscopic image presents as many pixels P1 - P4 as the N viewpoint 0, 1, 2, 3 image presents color points RGB of TR1- TR4. This statement is inaccurate. In Fig. la of U.S. Patent No. 5,936,607, the part of the autostereoscopic image that is shown has four pixels PX4, PX3...PX1 (or TR1- TR4), each having three color points RGB. PX4, PX3...PX1, designate the pixels as taken by an auto-stereoscopic camera and TR1...TR4 the same pixels for the display. TR1T...R4 are displayed on the same number of pixels P1...P4 of the screen with a shift so that the three color points of TR1 are seen in the same position (left position) with respect to lenses L1 L3 and so on for TR2...TR4. As can be seen, all p = 3 color points of PX4, of PX3, of

PX2 and of PXl are used for the display of TR1...TR4, so that the autostereoscopic image to be displayed has the same number of pixels as the screen.

The method of the present invention requires for p = 3 to retain only one color point of each pixel of the autostereoscopic image, which requires 4 x 3 = 12 pixels, namely T_1, T_2 and T_3 of PV1, T_1, T_2, T_3 of PV2, T_1, T_2, T_3 of PV3 and T_1, T_2, T_3 of PV4 as shown in Fig. 1 of the Application instead of the four pixels PX4... PX1 or TR1...TR4. Therefore, claim 1 is not taught or suggested by International Publication No. WO 94/26072 (i.e., U.S. Patent No. 5,936,907). Applicant asserts that claim 1 is allowable and requests indication of the same.

Claims 2-17 and 19-25 depend, either directly or indirectly, from one of claims 1 and 18, and consequently, include patentable subject matter for the reasons set forth above with respect to claims 1 and 18. Accordingly, dependent claims 2-17 and 19-25 are allowable. In addition, Applicant will separately address some of the Office's remarks relating to the dependent claims.

For claims 13 and 22, Applicant asserts that the Examiner mischaracterized the content of Fig. la of U.S. Patent No. 5,936,607. To assist the Examiner, Applicant, which is also the inventor of U.S. Patent No. 5,936,607, will first address the symbols of Fig. 1a.

With reference to Fig. 1a, P1 to P4 are pixels of the screen, each comprised of three color points red R, green G and blue B. 0, -1, -2, +1, +2 designate the number of pixels a color component is shifted (see column 4, lines 2 - 35). TR1...TR4 designate the four pixels to be displayed on the screen with the permutation of color points. TR1...TR4 correspond to pixels PX4...PX1, respectively, taken by a stereoscopic camera. Since in the example of U.S. Patent No. 5,936,607 the picture was taken with a camera according to U.S. Patent No. 5,509,320, which gives a pseudosteroscopic and not an orthosteroscopic image, groups of N = 4 pixels have to be inverted, and this is why TR_1 is PX4, TR2 is PX3, TR_3 is PX2 and TR4 is PX1 (see column 4, lines 36-51 of U.S. Patent No. 5,936,607). Red color component R of PX4 is not shifted (0), so it appears under lenslet Ll. Green color component G of PX4 is shifted by one pixel (+ 1), so it appears under lenslet L2. Blue color component B of PX4 is shifted by two pixels (+2) so it

appears under lenslet L3. As can be seen and explained above, all three color components R, G and B of each pixel PX4...PXl are used so that there is the same number of pixels in the autostereoscopic image as there are pixels on the screen.

Referring now to page 4 of the pending Office action, 0, 1, 2, 3 don't designate the pixels of the N viewpoints, but the amount of shift (positive or negative) of the color points, hence the confusion between the color points and the pixels (a pixel is comprised of p = 3 color points R, G and B). In Fig. 1a of U.S. Patent No. 5,936,607, the first pixel TR1 is comprised of three color points R, G and B. R is not shifted, so the number is 0 (R 0), G being shifted by +1, (G +1) and B being shifted by +2 (B +2) when displayed on the screen. On the appended drawing (Exhibit 1), the lines showing how TR1 (= PX4) is displayed by shifting its three color components R, G, and B have been highlighted.

So, it appears that, in the Office action, there is also an inversion between the display on the screen (pixels P1...P4) and the autostereoscopic image (TR_1...TR_4). In Fig. la of U.S. Patent No. 5,936,607, each color point of the pixels TRl...TR4 is used for display and each color point of the pixels Pl...P4 of the screen correspond to a color point of a pixel of the group TR1...TR4, because in each case there are the same number of pixels, namely 4. Whereas in Fig. 1 of the Application, there are 12 pixels and only one color component of each of these pixel is used.

In claims 13 and 22, in correspondence with Fig. 1 of the present Application (with p = 3), the display auto stereoscopic image comprises:

> a first pixel TR1 corresponding to a first viewpoint which is made up of a first color point R which is the color point of the first color component of the first pixel T1 of said three different pixels (T1, T2, T3) of the first viewpoint PV1, a second color point G which is the second color component G of the second pixel T2 of said three different pixels (T1, T2, T3) of the first viewpoint PV1, and a third color component B which is the third color component B of the third pixel T3 of said three different pixels (T1, T2, T3) of the first viewpoint PV1.

The situation is similar for the other points of views. As can be seen in the appended drawing, instead of being made up of the three color components RGB of the <u>one</u> pixel TR1(= PX4), TR1 is made up of the color component R of pixel T1 of PV1, the color

component G of pixel T2 of PV1, and the color component B of pixel T3 of PV1, i.e. from one color component only of each of the three pixels T1, T2, T3. The same remark is of course also valid for the other points of views PV2, PV3 and PV4. Therefore, claims 13 and 22 are not taught or suggested by International Publication No. WO 94/26072 (i.e., U.S. Patent No. 5,936,907).

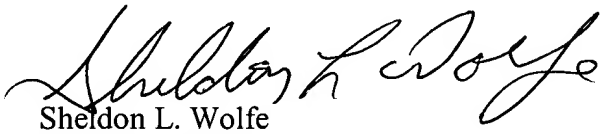
In view of the extensive explanation that is given above, it can be readily understood that the same reasoning applies to claim 18. According to claim 18, each of the p color points of each pixel is constituted by a color point of a corresponding color component of p different pixels of a group of p pixels of a viewpoint of a high definition autostereoscopic image presenting at least as many pixels having p color points as the N viewpoint autostereoscopic image presents color points. It clearly appears that this N viewpoint auto stereoscopic image is made up of pixels each of which comprises p color points that come from p different pixels of the high definition auto stereoscopic image, where only one color component of each pixel of the high definition auto stereoscopic image is retained. Therefore, claim 18 is not taught or suggested by International Publication No. WO 94/26072 (i.e., U.S. Patent No. 5,936,907).

U.S. Patent No. 6,184,969 has been cited as regarding definition enhancing techniques of a display using polarization. This document fails to give any teaching that could be relevant to the specificity of stereoscopic viewing.

CONCLUSION

Entry of this Amendment and allowance of claims 1-25 are respectfully requested. The undersigned is available for telephone consultation at any time during normal business hours.

Respectfully submitted,



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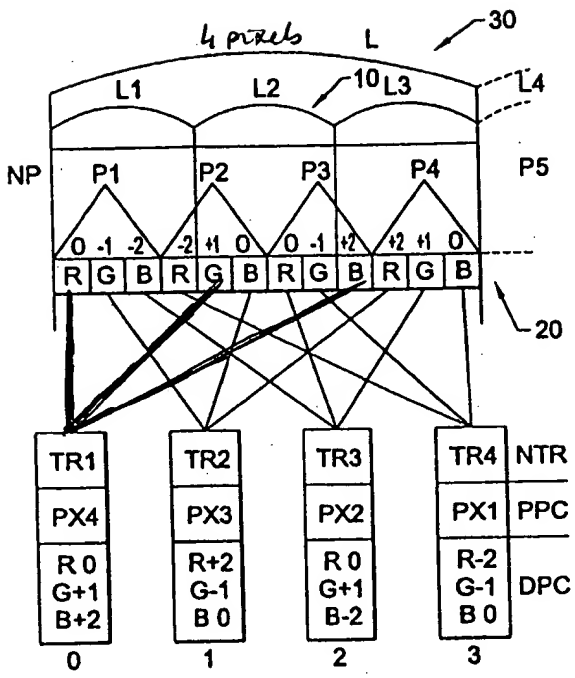

FIG. 1a. 4 pixels

PRIOR ART

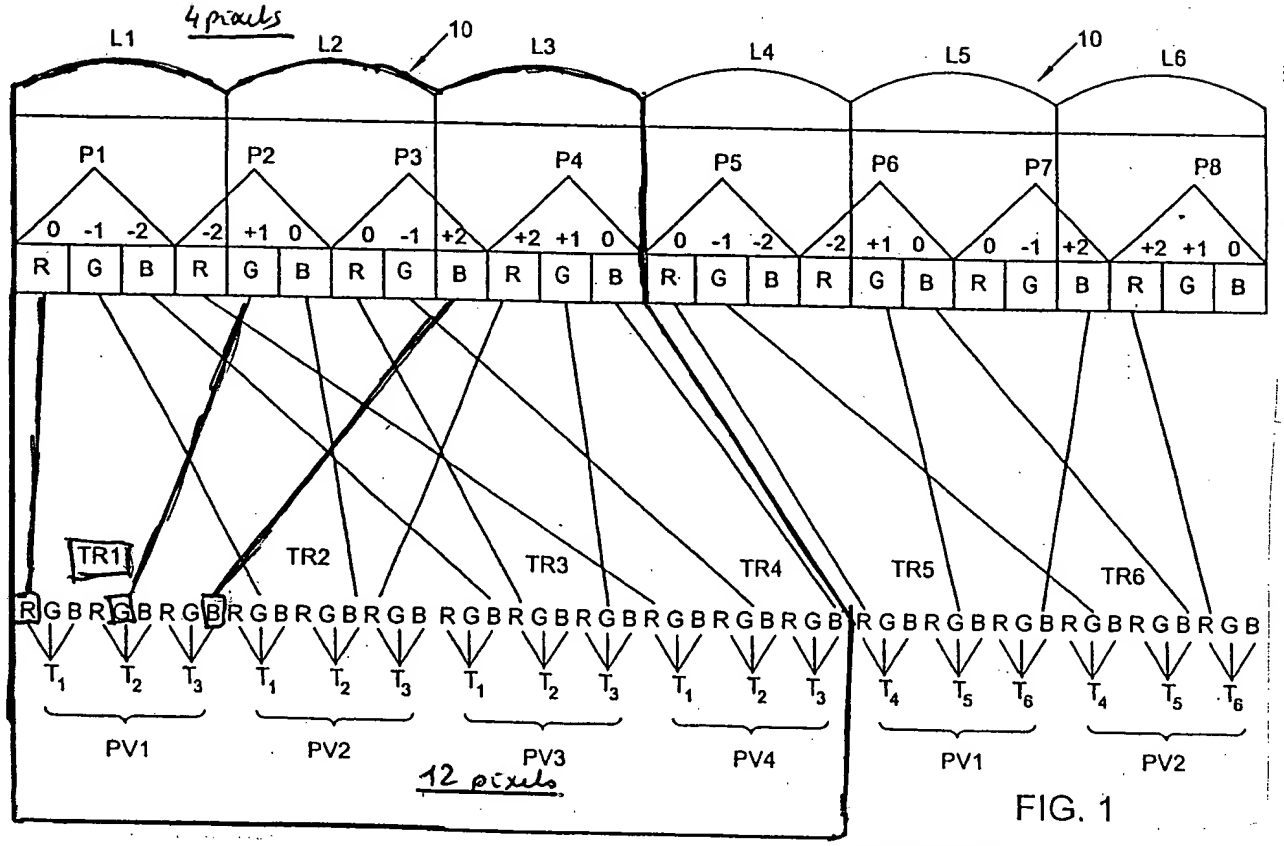

FIG. 1

INVENTION